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**REMARKS**

Claims 1 and 5 are currently being amended. These amendments do not introduce new matter within the meaning of 35 U.S.C. §132. Accordingly, the Examiner is respectfully requested to enter these amendments.

1. Rejection of Claims 1 and 3-5 Under 35 U.S.C. §103(a) over  
U.S. Patent 4,536,550 in view of U.S. Patent 5,405,922

Applicant respectfully traverses the rejection of claims 1 and 3-5 to U.S. Patent 4,536,550 (herein referred to as "Moriguchi, et al.") in view of U.S. Patent 5,405,922 (herein referred to as "DeChellis, et al.").

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under §103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

Accordingly, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when

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combined) must teach or suggest all the claim limitations. See MPEP §2142.

First and foremost, as outlined in Applicant's previous response of April 1, 2008, Applicant respectfully believes the Examiner has not established a *prima facie* case of obviousness, as required *supra*. In particular, Moriguchi, et al. relates to compositions produced by using **Ziegler-type catalysts**. See col. 4, line 32 - col. 5, line 23. However, DeChellis, et al. clearly discloses in col. 2, lines 30-34, and col. 3, line 7-10,

This invention relates to a continuous gas phase polymerization process for polymerizing alpha-olefins utilizing a **bulky ligand transition metal catalyst**, for example a **metallocene**, in a gas phase fluidized bed reactor operating in a condensed mode. (Emphasis added)

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This invention relates to the gas phase polymerization process for polymerizing olefins utilizing a **metallocene** in a gas phase fluidized bed polymerization reactor operating in a condensed mode. (Emphasis added)

Additionally, DeChellis, et al. discloses in col. 1, lines 58-68, and col. 2, lines 13-19,

The catalyst system described in Jenkins, III et al. is a **TiCl<sub>3</sub>** based traditional Ziegler-Natta catalyst system. Using this catalyst system in a condensed mode operation results inevitably in a process and product constraints as will become apparent later in this specification. The process limitations limit production rates and significantly increase the cost of producing polymers. Also, as a direct consequence of using these traditional catalysts in this process the polymers available for production are restricted to certain densities and melt indices. (Emphasis added)

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Traditional catalyst systems and polymers produced therewith restrict these values, and as a direct consequence of this, drastically reduce production rates achievable for any given polymer being produced. Furthermore, these traditional catalysts and catalyst systems limit the type and characteristics of the polymer. (Emphasis added)

Accordingly, DeChellis, et al. clearly discloses the process therein requires the use of metallocene catalyst systems, and that traditional, Ziegler-Natta catalyst systems do not produce compositions having the proper characteristics. In fact, DeChellis, et al. clearly teaches away from using traditional, Zeigler-Natta catalyst systems, and that the process and resultant polymer characteristics produced therein result directly from using metallocene catalysts. Accordingly, Applicant respectfully believes one skilled in the art would not have modified Moriguchi, et al. as suggested by the Examiner, given DeChellis, et al. expressly teaches away from such modification. A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983). Additionally, see MPEP §2141.02 VI, and §2145 XD. Accordingly, for this reason alone, Applicant respectfully believes

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the current rejection should be withdrawn.

Additionally, as previously outlined in Applicant's response of April 1, 2008, Applicant respectfully notes the Examiner refers to col. 5, lines 45-53 of DeChellis to support the current rejection. In particular, the aforementioned highlighted sections of DeChellis, et al. discloses,

For the preferred alpha-olefin monomer ethylene, depending on the catalyst, the  $C_x/C_2$  ratios are preferably less than about 0.2, and more preferably less than about 0.1 and as low as about 0.002 to provide a polymer having a density in the range of from about 0.86 g/cm<sup>3</sup> to about 0.96 g/cm<sup>3</sup>, preferably about 0.88 g/cm<sup>3</sup> to about 0.94 g/cm<sup>3</sup> and most preferably between about 0.90 g/cm<sup>3</sup> to about 0.935 g/cm<sup>3</sup>.

However, as outlined above, the passage highlighted by the Examiner hinges on the fact that DeChellis, et al. discloses the compositions are produced with metallocene catalysts, and that the characteristics of the resultant polymer produced are necessarily derived from the metallocene catalyst systems. Nevertheless, the passage also only relates to the comonomer content of a single ethylene copolymer composition. However, Applicant is currently claiming polyethylene compositions comprising **three components**, namely: (i) 35 to 45% of a low-molecular-mass ethylene homopolymer A; (ii) 34 to 44% of a high-molecular-mass ethylene copolymer B, comprising a  $C_4$ - $C_8$  comonomer content of less than 0.1%; and (iii) 18 to 26% of an ultrahigh-molecular-mass ethylene copolymer C, comprising from 0.1 to 0.6% by weight of comonomer. In this regard, Applicant respectfully believes the Examiner has not addressed this

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factual discrepancy. Accordingly, Applicant respectfully believes the current rejection should be withdrawn.

Furthermore, Applicant responds as follows with respect to the Examiner's remarks on page 11, line 22 - page 12, line 3, in the current Office Action, which states,

B) In response to applicant's argument that Moriguchi et al. and DeChellis et al. use different catalyst, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In the instant instance, DeChellis et al. teaches how the amount of the second olefin affects the density of the resin.

However, Applicant respectfully traverses the Examiner's position outlined above. First and foremost, as outlined *supra*, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §2142. However, Applicant respectfully believes the Examiner has failed to establish a *prima facie* case of obviousness in light of the standards set forth above.

Additionally, Applicant responds as follows with respect to the

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Examiner's remarks,

. . . the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

However, this does not mean the Examiner can arbitrarily pick and choose whatever he or she feels is more favorable from multiple prior art documents, while ignoring parts of the disclosure from the prior documents that are less favorable or would teach away from the instantly claimed composition, to try and arrive at a mosaic of Applicant's currently claimed polyethylene compositions. See *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Rather, the Examiner must step back in time, at the time of filing of the instant application, and examine the currently claimed inventive subject matter, as well as the prior art, **as a whole**, and as one having ordinary skill in the art would have done. In fact, Applicant respectfully believes the Examiner is arbitrarily picking and choosing certain selected portions from multiple prior art documents, while ignoring other less favorable portions that would, in fact, teach away from Applicant's currently claimed polyethylene compositions, without viewing the prior art documents as a whole as one having ordinary skill in the art would have done at the time of

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filing of the instant application. However, this type of examination based on hindsight, in which the Examiner uses Applicant's currently claimed polyethylene compositions as a blue print to assemble various portions from various disclosures, is impermissible. See MPEP §2141.02 (I) and (VI), §2142, §2143.01 (VI), and §2145 (X) (A).

Additionally, the Examiner has not explained why, absent the specific teaching in Applicant's specification, one having ordinary skill in the art would have done as suggested by the Examiner, insomuch that the Examiner has failed to explain why, absent Applicant's specification, one having ordinary skill in the art would have modified Moriguchi, et al. and DeChellis, et al. as suggested by the Examiner. However, as outlined above, this is the Examiner initial burden to satisfy a *prima facie* case of obviousness. Albeit, if the Examiner maintains the current rejection, Applicant respectfully requests the Examiner to address the factual discrepancies outlined above, and outline why, with factual, objective evidence one would have modified the express disclosure of Moriguchi, et al. and DeChellis, et al., especially given their express disclosure against such modification.

Notwithstanding all of the above, Applicant is currently claiming polyethylene compositions comprising a multimodal molecular mass distribution, which has a density in the range of from 0.950 to 0.956 g/cm<sup>3</sup> at 23 °C, an MFR<sub>190/21.6</sub> in the range of from 1.5 to 3.5

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dg/min and which comprises from 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A; from 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B; and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C, wherein the percentage data of homopolymer A, copolymer B, copolymer C are based on the total weight of the polyethylene composition, and the polyethylene composition has a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>. Accordingly, as outlined on page 5, lines 4-9, in Applicant's specification,

The composition of the invention gives particularly good processing behavior in the blow molding process to give L-ring drums because it has a swell ratio in the range of from 180 to 220 %, and the L-ring drums produced therewith have particularly high mechanical strength because the composition of the invention has a notched impact strength (ISO) in the range of from 60 to 90 kJ/m<sup>2</sup>. The stress-crack resistance (FNCT) is in the range of from 15 to 25 h.

As such, Applicant has unexpectedly found the currently claimed polyethylene compositions comprise particularly good processing properties for blow molding processes due to the currently claimed compositions comprising a combination of a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to



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90 kJ/m<sup>2</sup>.

However, the Examiner has not explained where and how Moriguchi, et al. alone, or in combination with DeChellis, et al., discloses how such advantageous processing properties can be obtained, nor has the Examiner explained, absent Applicant's specification, why one of ordinary skill in the art would have modified Moriguchi, et al. alone, or in combination with DeChellis, et al., in order to try and arrive at Applicant's currently claimed polyethylene compositions comprising better processing properties from a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>. However, as outlined *supra*, this is the Examiner's initial burden to satisfy a *prima facie* case of obviousness.

In light of the above, Applicant respectfully believes claim 1 and 3-5 are patentable over Moriguchi, et al. in view of DeChellis, et al. Therefore, allowance of the claims is earnestly requested.

**2. Rejection of Claims 1 and 3-5 Under 35 U.S.C. §103(a) over**  
**U.S. Patent 6,713,561 in view of U.S. Patent 5,405,922**

Applicant respectfully traverses the rejection of claims 1 and 3-5 to U.S. Patent 6,713,561 (herein referred to as "Berthold, et al. I") in view of U.S. Patent 5,405,922 (herein referred to as "DeChellis, et al.>").

The instant application claims priority to U.S. provisional application 60/445,165, which was filed on February 5, 2003, whereas

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Berthold, et al. I has a 35 U.S.C. §371 date of March 21, 2002, and a publication date of March 30, 2004 (i.e., as U.S. Patent 6,713,561). Accordingly, Applicant respectfully believes Berthold, et al. I can only be considered under 35 U.S.C. §102(e) for the instant rejection under 35 U.S.C. §103(a). However, given the provisions of 35 U.S.C. §103(c), Applicant respectfully believes the instant rejection should be withdrawn.

In particular, the currently claimed subject matter and the subject matter contained in Berthold, et al. I are believed to be commonly owned, and it is believed Applicant was subject to an obligation of assignment to the owner of Berthold, et al. I at the time the claimed invention was made. Applicant has included herein as Attachment B (1) a copy of the assignee of record for the currently pending application; and (2) a copy of the assignee of record for the Berthold, et al. I from the U.S. Assignment database.

In light of the above, Applicant respectfully believes the instant rejection should be withdrawn.

3. Rejection of Claims 1 and 3-5 Under 35 U.S.C. §103(a) over WO

01/23446 in view of U.S. Patent 5,405,922

Applicant respectfully traverses the rejection of claims 1 and 3-5 to WO 01/23446 (herein referred to as "Berthold, et al. II") in view of U.S. Patent 5,405,922 (herein referred to as "DeChellis, et al.").

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148

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U.S.P.Q. 459 (1966) held that non-obviousness was determined under §103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness.

Accordingly, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. See MPEP §2142.

Arguments regarding DeChellis, et al. are incorporated herein by reference in their entirety.

With respect to the instant rejection, Applicant respectfully believes Berthold, et al. II fails to disclose, teach, or suggest Applicant's currently claimed polyethylene compositions comprising:

- (i) a multimodal molecular mass distribution;
- (ii) a density in the range of from 0.950 to 0.956 g/cm<sup>3</sup> at 23 °C;
- (iii) an MFR<sub>190/21.6</sub> in the range of from 1.5 to 3.5 dg/min.;
- (iv) 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A;

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- (v) 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B;
- (vi) 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C;
- (vii) the polyethylene composition comprising a swell ratio ranging from 180 to 220%; and
- (viii) the polyethylene composition comprising a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>.

In fact, Applicant respectfully believes Berthold, et al. II discloses a broad range for each component, namely 30 to 60% by weight of a low-molecular weight ethylene homopolymer as component (A), 30 to 65% by weight of a high-molecular weight ethylene copolymer as component (B), and 1 to 30% by weight of an ultrahigh-molecular weight ethylene homopolymer or copolymer as component (C). Alternatively, Applicant's currently claimed polyethylene compositions comprise from 35 to 45% by weight of a low-molecular mass ethylene homopolymer as component (A), from 34 to 44% by weight of a high-molecular mass ethylene copolymer comprising less than 0.1% by weight of a first 1-olefin comprising from 4 to 8 carbon atoms as component (B), and from 18 to 26% by weight of an ultrahigh-molecular mass ethylene copolymer comprising from 0.1 to

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0.6% by weight of a second 1-olefin comonomer.

Additionally, as outlined *supra*, Applicant has unexpectedly found the currently claimed polyethylene compositions comprise particularly good processing properties for blow molding processes due to the currently claimed compositions comprising a combination of a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>. However, the Examiner has not explained **where** and **how** Berthold, et al. II alone, or in combination with DeChellis, et al., discloses how such advantageous processing properties can be obtained, nor has the Examiner explained, absent Applicant's specification, **why** one of ordinary skill in the art would have modified Berthold, et al. II alone, or in combination with DeChellis, et al., in order to try and arrive at Applicant's currently claimed polyethylene compositions comprising better processing properties from a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>. However, as outlined *supra*, this is the Examiner's initial burden to satisfy a *prima facie* case of obviousness.

In light of the above, Applicant respectfully believes claim 1 and 3-5 are patentable over Berthold, et al. II in view of DeChellis, et al. Therefore, allowance of the claims is earnestly requested.

#### 4. Double Patenting

Applicant respectfully traverses the rejection of claims 1 and

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3-5 to claims 1, 2, and 5-8 of U.S. Patent 6,713,561 (herein referred to as "Berthold, et al. I"). All arguments *supra* regarding Berthold, et al. I are incorporated herein by reference in their entirety.

*Non-statutory, Obviousness-type Double Patenting:*

The doctrine of double patenting seeks to prevent the unjustified extension of patent exclusivity beyond the term of a patent. The public policy behind this doctrine is that:

The public should. . . be able to act on the assumption that upon the expiration of the patent it will be free to use not only the invention claimed in the patent but also modifications or variants which would have been obvious to those of ordinary skill in the art at the time the invention was made, taking into account the skill in the art and prior art other than the invention claim in the issued patent.

*In re Zickendraht*, 319 F.2d 225, 232, 138 USPQ 22, 27 (CCPA 1963) (Rich, J., concurring).

In determining whether basis for an obviousness-type double patenting rejection exists, the analysis employed parallels the guidelines for a 35 U.S.C. 103(a) rejection. In particular, the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), are applied for establishing a background for determining obviousness under 35 U.S.C. 103, and are then applied for determining an obvious-type double patenting analysis. These factual inquiries are summarized as follows:

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- (A) Determine the scope and content of a patent claim relative to a claim in the application at issue;
- (B) Determine the differences between the scope and content of the patent claim as determined in (A) and the claim in the application at issue;
- (C) Determine the level of ordinary skill in the pertinent art; and
- (D) Evaluate any objective indicia of nonobviousness.

The conclusion of obviousness-type double patenting is made in light of these factual determinations.

Additionally, any obviousness-type double patenting rejection should make clear:

- (A) The differences between the inventions defined by the conflicting claims - a claim in the patent compared to a claim in the application; and
- (B) The reasons why a person of ordinary skill in the art would conclude that the invention defined in the claim at issue is anticipated by, or would have been an obvious variation of, the invention defined in a claim in the patent.

Moreover, when considering whether the inventive subject matter defined in a claim of an application would have been an obvious variation of the inventive subject matter defined in the claim of a patent, the disclosure of the patent may not be used as prior art.

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*General Foods Corp. v. Studiengesellschaft Kohle mbH*, 972 F.2d 1272, 1279, 23 USPQ2d 1839, 1846 (Fed. Cir. 1992), (Emphasis added).

With respect to the current rejection, currently pending claims 1 and 3-5 are directed towards a polyethylene composition. All currently pending and withdrawn claims (i.e., claims 1 and 3-10) are submitted herewith as ATTACHMENT A.

With respect to Berthold, et al. I, claims 1-2 and 5-9 are directed towards a molding compound; claims 3-4 are directed towards a method for producing a polyethylene compound; claims 10-11 are directed towards an article; and claim 12 is directed towards a process to make an article. Claims 1-12 of Berthold, et al. I were previously submitted as ATTACHMENT C with Applicant's response of April 1, 2008.

Currently pending claims 1-5:

Claim 1 of the current application recites,

A polyethylene composition with multimodal molecular mass distribution, which has a density in the range of from 0.950 to 0.956 g/cm<sup>3</sup> at 23 °C, an MFR<sub>190/21.6</sub> in the range of from 1.5 to 3.5 dg/min and which comprises from 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A; from 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B; and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C, wherein the percentage data of homopolymer A, copolymer B, copolymer C are based on the total weight of the polyethylene composition, and the polyethylene composition has a swell ratio ranging from 180 to 220%,



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and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>.

Applicant respectfully believes none of claims 1-12 in Berthold, et al. I recite the same, or an obvious variant of currently pending claim 1. Additionally, currently pending claims 3-5 depend directly or indirectly from currently pending claim 1, and necessarily include all of the limitations therein. As such, Applicant believes claims 1 and 3-5 are patentably distinct from claims 1-12 in Berthold, et al. I.

Moreover, Applicant respectfully traverses the current rejection since the Examiner has not made clear: (A) **the differences between the inventive subject matter** defined by the conflicting claims; and (B) the reasons **why** a person of ordinary skill in the art would conclude that the inventive subject matter defined in the claim at issue is anticipated by, or would have been an obvious variation of, the inventive subject matter defined in a claim in the patent. See MPEP §804 (1).

Furthermore, Applicant respectfully believes the Examiner has not properly compared the **currently pending claims** in the above-captioned application to the **allowed claims** in Berthold, et al. I, and outlined: (A) **the differences** between the inventive subject matter defined by the conflicting claims; and (B) the reasons **why** a person of ordinary skill in the art would conclude that the inventive subject matter defined in the **currently rejected claims**

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are anticipated by, or would have been an obvious variation of, the inventive subject matter defined in a claim or claims in the cited patent. See MPEP §804 (1).

Accordingly, Applicant respectfully believes the current rejection should be withdrawn.

#### 5. Double Patenting

Applicant respectfully traverses the rejection of claims 1 and 3 to claims 1-3 of co-pending U.S. patent application 10/537,728, which is now U.S. Patent 7,427,649, (herein referred to as "Berthold, et al. III").

#### *Non-statutory, Obviousness-type Double Patenting:*

The doctrine of double patenting seeks to prevent the unjustified extension of patent exclusivity beyond the term of a patent. The public policy behind this doctrine is that:

The public should. . . be able to act on the assumption that upon the expiration of the patent it will be free to use not only the invention claimed in the patent but also modifications or variants which would have been obvious to those of ordinary skill in the art at the time the invention was made, taking into account the skill in the art and prior art other than the invention claim in the issued patent.

*In re Zickendraht*, 319 F.2d 225, 232, 138 USPQ 22, 27 (CCPA 1963) (Rich, J., concurring).

In determining whether basis for an obviousness-type double patenting rejection exists, the analysis employed parallels the

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guidelines for a 35 U.S.C. 103(a) rejection. In particular, the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), are applied for establishing a background for determining obviousness under 35 U.S.C. 103, and are then applied for determining an obvious-type double patenting analysis. These factual inquiries are summarized as follows:

- (A) Determine the scope and content of a patent claim relative to a claim in the application at issue;
- (B) Determine the differences between the scope and content of the patent claim as determined in (A) and the claim in the application at issue;
- (C) Determine the level of ordinary skill in the pertinent art; and
- (D) Evaluate any objective indicia of nonobviousness.

The conclusion of obviousness-type double patenting is made in light of these factual determinations.

Additionally, any obviousness-type double patenting rejection should make clear:

- (A) The differences between the inventions defined by the conflicting claims - a claim in the patent compared to a claim in the application; and
- (B) The reasons why a person of ordinary skill in the art would conclude that the invention defined in the claim at issue is anticipated by, or would have been an obvious

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variation of, the invention defined in a claim in the patent.

Moreover, when considering whether the inventive subject matter defined in a claim of an application would have been an obvious variation of the inventive subject matter defined in the claim of a patent, the disclosure of the patent may not be used as prior art. *General Foods Corp. v. Studiengesellschaft Kohle mbH*, 972 F.2d 1272, 1279, 23 USPQ2d 1839, 1846 (Fed. Cir. 1992), (Emphasis added).

With respect to the current rejection, currently pending claims 1 and 3-5 are directed towards a polyethylene composition. All currently pending and withdrawn claims (i.e., claims 1 and 3-10) are submitted herewith as ATTACHMENT A.

With respect to Berthold, et al. III, claims 1-5 and 8 are directed towards a polyethylene composition; claims 6 and 9 are directed towards a process for producing a polyethylene compound; and claims 7 and 10 are directed towards a process for producing a blow molding. Claims 1-10 of Berthold, et al. III are submitted herein as ATTACHMENT D.

Currently pending claims 1-5:

Claim 1 of the current application recites,

A polyethylene composition with multimodal molecular mass distribution, which has a density in the range of from 0.950 to 0.956 g/cm<sup>3</sup> at 23 °C, an MFR<sub>190/21.6</sub> in the range of from 1.5 to 3.5 dg/min and which comprises from 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A; from 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less

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than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B; and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C, wherein the percentage data of homopolymer A, copolymer B, copolymer C are based on the total weight of the polyethylene composition, and the polyethylene composition has a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>.

Applicant respectfully believes none of claims 1-10 in Berthold, et al. III recite the same, or an obvious variant, of currently pending claim 1. Additionally, currently pending claims 3-5 depend directly or indirectly from currently pending claim 1, and necessarily include all of the limitations therein. As such, Applicant believes claims 1 and 3-5 are patentably distinct from claims 1-10 in Berthold, et al. III.

Moreover, Applicant respectfully traverses the current rejection since the Examiner has not made clear: (A) the differences between the inventive subject matter defined by the conflicting claims; and (B) the reasons why a person of ordinary skill in the art would conclude that the inventive subject matter defined in the claim at issue is anticipated by, or would have been an obvious variation of, the inventive subject matter defined in a claim in the patent. See MPEP §804 (1).

Furthermore, Applicant respectfully believes the Examiner has not properly compared the currently pending claims in the above-captioned application to the allowed claims in Berthold, et al. III,

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and outlined: (A) the differences between the inventive subject matter defined by the conflicting claims; and (B) the reasons why a person of ordinary skill in the art would conclude that the inventive subject matter defined in the currently rejected claims are anticipated by, or would have been an obvious variation of, the inventive subject matter defined in a claim or claims in the cited patent. See MPEP §804 (1).

Accordingly, Applicant respectfully believes the current rejection should be withdrawn.

#### CONCLUSION

Based upon the above remarks and amendments submitted herein, the presently claimed subject matter is believed to be novel and patentably distinguishable over the prior art of record. The Examiner is therefore respectfully requested to reconsider and withdraw the rejections, and allow pending claims 1 and 3-5. Favorable action with an early allowance of the claims pending in this application is earnestly solicited.

The Examiner is welcomed to telephone the undersigned practitioner if any questions or comments arise, or such action would expedite prosecution of this application.

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Respectfully submitted,

By: 

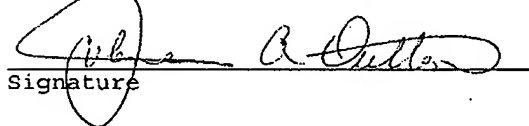
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U.S. Patent Application  
Serial No. 10/538,894

ATTACHMENT A

1. (Currently Amended) A polyethylene composition with multimodal molecular mass distribution, which has a density in the range of from 0.950 to 0.956 g/cm<sup>3</sup> at 23 °C, an MFR<sub>190/21.6</sub> in the range of from 1.5 to 3.5 dg/min and which comprises from 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A; from 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B; and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C, wherein the percentage data of homopolymer A, copolymer B, copolymer C are based on the total weight of the polyethylene composition, and the polyethylene composition has a swell ratio ranging from 180 to 220%, and a noticed impact strength (ISO) ranging from 60 to 90 kJ/m<sup>2</sup>.
2. (Cancelled)
3. (Previously Presented) The polyethylene composition as claimed in claim 1, wherein the first 1-olefin and second 1-olefin comonomers are independently selected from 1-butene, 1-pentene, 1-hexene, 1-octene, 4-methyl-1-pentene, or mixtures of these.



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4. (Previously Presented) The polyethylene composition as claimed in claim 1, which has a viscosity number  $VN_{tot}$  of from 500 to 600  $cm^3/g$  measured to ISO/R 1191 in decalin at 135 °C.
5. (Currently Amended) The polyethylene composition as claimed in claim 1, which has ~~a swell ratio in the range from 180 to 220 %, a notched impact strength (ISO) in the range from 60 to 90 kJ/m<sup>2</sup>, and a stress-crack resistance (FNCT) in the range from 15 to 25 h.~~
6. (Withdrawn) A process for producing a polyethylene composition with multimodal molecular mass distribution, which has a density in the range of from 0.950 to 0.956  $g/cm^3$  at 23 °C, an  $MFR_{190/21.6}$  in the range of from 1.5 to 3.5 dg/min and which comprises from 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A; from 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B; and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C, wherein the percentage data of homopolymer A, copolymer B, copolymer C are based on the total weight of the polyethylene composition, wherein the monomers are polymerized in slurry in a temperature range of from 60 to 90 °C at a pressure in the range of from 0.15 to 1.0 MPa, and in the presence of a high-mileage Ziegler catalyst composed of a transition metal compound and of an organoaluminum compound, the process

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comprising conducting polymerization in three stages, wherein the molecular mass of each polyethylene prepared in each stage is regulated with the aid of hydrogen, thereby forming a hydrogen concentration in each stage.

7. (Withdrawn) The process as claimed in claim 6, wherein the hydrogen concentration in the first polymerization stage is adjusted so that a viscosity number  $VN_1$  of the low-molecular-mass ethylene homopolymer A is in the range of from 160 to 220  $\text{cm}^3/\text{g}$ .
8. (Withdrawn) The process as claimed in claim 6, wherein the hydrogen concentration in the second polymerization stage is adjusted so that a viscosity number  $VN_2$  of a mixture of polymer A and polymer B is in the range of from 230 to 320  $\text{cm}^3/\text{g}$ .
9. (Withdrawn) The process as claimed in claim 6, wherein the hydrogen concentration in the third polymerization stage is adjusted so that a viscosity number  $VN_3$  of a mixture of polymer A, polymer B, and polymer C is in the range of from 500 to 600  $\text{cm}^3/\text{g}$ .
10. (Withdrawn) A process for producing an L-ring drum having a capacity in a range from 50 to 250  $\text{dm}^3$  (l) from a polyethylene composition with multimodal molecular mass distribution, which has a density in the range of from 0.950 to 0.956  $\text{g}/\text{cm}^3$  at 23 °C, an  $\text{MFR}_{190/21.6}$  in the range of from 1.5 to 3.5  $\text{dg}/\text{min}$  and which comprises from 35 to 45 % by weight of a low-molecular-mass ethylene homopolymer A; from 34 to 44 % by weight of a high-molecular-mass copolymer B made from ethylene and less

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than 0.1% by weight of a first 1-olefin comonomer having from 4 to 8 carbon atoms, based on the weight of copolymer B; and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C containing from 0.1 to 0.6% by weight of a second 1-olefin comonomer, based on the weight of copolymer C, wherein the percentage data of homopolymer A, copolymer B, copolymer C are based on the total weight of the polyethylene composition, the process comprising:

- (a) plasticizing the polyethylene composition in an extruder in a temperature range of from 200 to 250 °C;
- (b) extruding the product of step (a) through a die into a mold;
- (c) blowing up the product of step (b) in a blow molding apparatus, thereby forming the L-ring drum; and

solidifying the L-ring drum by cooling.

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ATTACHMENT B



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Assignments on the Web &gt; Patent Query

**Patent Assignment Abstract of Title****NOTE: Results display only for issued patents and published applications.  
For pending or abandoned applications please consult USPTO staff.****Total Assignments: 3**

Patent #: 6713561 Issue Dt: 03/30/2004 Application #: 10088855 Filing Dt: 03/21/2002

Inventors: Joachim Berthold, Ludwig Bohm, Johannes-Friedrich Enderle, Reinhard Schubbach

Title: POLYETHYLENE MOULDING COMPOUND WITH AN IMPROVED ESCR/STIFFNESS RELATION AND AN IMPROVED SWELLING RATE, A METHOD FOR THE PRODUCTION THEREOF AND THE USE THEREOF

**Assignment: 1**

Reel/Frame: 012898/0272

Recorded: 03/04/2002

Pages: 2

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Assignors: BERTHOLD, JOACHIM

Exec Dt: 01/21/2002

BOHM, LUDWIG

Exec Dt: 01/15/2002

ENDERLE, JOHANNES-FRIEDRICH

Exec Dt: 01/18/2002

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Exec Dt: 11/26/2001

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**Assignment: 2**

Reel/Frame: 020704/0562

Recorded: 03/26/2008

Pages: 88

Conveyance: GRANT OF SECURITY INTEREST IN UNITED STATES PATENTS AND PATENT APPLICATIONS

Assignors: BASELL POLYOLEFINE GMBH

Exec Dt: 12/20/2007

ARCO CHEMICAL TECHNOLOGY L.P.

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ATLANTIC RICHFIELD COMPANY

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BASELL NORTH AMERICA, INC.

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EQUISTAR CHEMICALS, LP.

Exec Dt: 12/20/2007

LYONDELL CHEMICAL COMPANY

Exec Dt: 12/20/2007

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LYONDELL PETROCHEMICAL COMPANY

Exec Dt: 12/20/2007

NATIONAL DISTILLERS AND CHEMICAL CORPORATION

Exec Dt: 12/20/2007

OCCIDENTAL CHEMICAL CORPORATION

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OLJN CORPORATION

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NEW YORK, NY 10036

**Assignment: 3****Reel/Frame:** 021354/0708**Recorded:** 08/04/2008**Pages:** 85**Conveyance:** SECURITY AGREEMENT**Assignors:** BASELL POLYOLEFINE GMBH**Exec Dt:** 12/20/2007ARCO CHEMICAL TECHNOLOGY L.P.**Exec Dt:** 12/20/2007ARCO CHEMICAL TECHNOLOGY, INC.**Exec Dt:** 12/20/2007ATLANTIC RICHFIELD COMPANY**Exec Dt:** 12/20/2007BASELL NORTH AMERICA, INC.**Exec Dt:** 12/20/2007BASELL POLYOLEFIN GMBH**Exec Dt:** 12/20/2007LYONDELL CHEMICAL COMPANY**Exec Dt:** 12/20/2007EQUISTAR CHEMICALS, L.P.**Exec Dt:** 12/20/2007**Assignee:** CITIBANK, N.A., AS COLLATERAL AGENT

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## Patent Assignment Abstract of Title

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## Total Assignments: 3

Patent #: NONE      Issue Dt:      Application #: 10538894      Filing Dt: 06/14/2005  
 Publication #: 20060052542      Pub Dt: 03/09/2006  
 Inventors: Joachim Berthold, Ludwig Bohm, Peter Krumpel, Rainer Mantel  
 Title: Polyethylene composition for producing I-ring drums

## Assignment: 1

Reel/Frame: 017184/0892      Recorded: 06/14/2005      Pages: 3

Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS).

Assignors: BERTHOLD, JOACHIM	Exec Dt: 05/30/2005
BOHM, LUDWIG	Exec Dt: 05/30/2005
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## Assignment: 2

Reel/Frame: 020704/0562      Recorded: 03/26/2008      Pages: 88

Conveyance: GRANT OF SECURITY INTEREST IN UNITED STATES PATENTS AND PATENT APPLICATIONS

Assignors: BASELL POLYOLEFINE GMBH	Exec Dt: 12/20/2007
ARCO CHEMICAL TECHNOLOGY L.P.	Exec Dt: 12/20/2007
ARCO CHEMICAL TECHNOLOGY, INC.	Exec Dt: 12/20/2007
ATLANTIC RICHFIELD COMPANY	Exec Dt: 12/20/2007
BASELL NORTH AMERICA, INC.	Exec Dt: 12/20/2007
EQUISTAR CHEMICALS, L.P.	Exec Dt: 12/20/2007
LYONDELL CHEMICAL COMPANY	Exec Dt: 12/20/2007
LYONDELL CHEMICAL TECHNOLOGY, L.P.	Exec Dt: 12/20/2007
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QUANTUM CHEMICAL CORPORATION	Exec Dt: 12/20/2007
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**Assignment: 3****Reel/Frame:** 021354/0708**Recorded:** 08/04/2008**Pages:** 85**Conveyance:** SECURITY AGREEMENT**Assignors:** BASELL POLYOLEFINE GMBH**Exec Dt:** 12/20/2007ARCO CHEMICAL TECHNOLOGY L.P.**Exec Dt:** 12/20/2007ARCO CHEMICAL TECHNOLOGY, INC.**Exec Dt:** 12/20/2007ATLANTIC RICHEFIELD COMPANY**Exec Dt:** 12/20/2007BASELL NORTH AMERICA, INC.**Exec Dt:** 12/20/2007BASELL POLYOLEFIN GMBH**Exec Dt:** 12/20/2007LYONDELL CHEMICAL COMPANY**Exec Dt:** 12/20/2007EQUISTAR CHEMICALS, L.P.**Exec Dt:** 12/20/2007

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ATTACHMENT D

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titanium compound instead of 13.5 mmol/h as in Example 1, together with 180 mmol/h of triethylaluminum.

The amount of ethylene (=72.8 kg/h) and the amount of hydrogen (=68 g/h) were adjusted so that the percentage proportion of ethylene and of hydrogen measured in the gas space of the first reactor were from 21 to 23% by volume and 67% by volume, respectively, and the rest was a mix of nitrogen and vaporized diluent.

The polymerization in the first reactor was carried out at 85° C.

The slurry from the first reactor was then transferred into a second reactor, in which the percentage proportion of hydrogen in the gas phase had been reduced between 6 to 8% by volume and an amount of 45 g/h of 1-butene was added to this

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comonomer having from 4 to 8 carbon atoms, wherein a mixture of homopolymer A and copolymer B has a viscosity number  $VN_2$  in the range from 150 to 200  $\text{cm}^3/\text{g}$ ; and

from 20 to 30% by weight of an ultrahigh-molecular-mass ethylene copolymer C containing a 1-olefin comonomer having from 4 to 8 carbon atoms, wherein a mixture of homopolymer A, copolymer B, and copolymer C has a viscosity number  $VN_3$  in the range from 260 to 340  $\text{cm}^3/\text{g}$ , and wherein all of the percentage data are based on the total weight of the composition.

2. The polyethylene composition as claimed in claim 1, wherein the 1-olefin comonomer of copolymer B is present in an amount from 0.1 to 0.6% by weight, based on the weight of



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ATTACHMENT D

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titanium compound instead of 13.5 mmol/h as in Example 1, together with 180 mmol/h of triethylaluminum.

The amount of ethylene (=72.8 kg/h) and the amount of hydrogen (=68 g/h) were adjusted so that the percentage proportion of ethylene and of hydrogen measured in the gas space of the first reactor were from 21 to 23% by volume and 67% by volume, respectively, and the rest was a mix of nitrogen and vaporized diluent.

The polymerization in the first reactor was carried out at 85° C.

The slurry from the first reactor was then transferred into a second reactor, in which the percentage proportion of hydrogen in the gas phase had been reduced between 6 to 8% by volume, and an amount of 45 g/h of 1-butene was added to this reactor alongside with 30.8 kg/h of ethylene. The amount of hydrogen was reduced by way of intermediate H<sub>2</sub> depressurization. 79% by volume of ethylene, 6 to 7% by volume of hydrogen, and 0.7% by volume of 1-butene were measured in the gas phase of the second reactor, the rest being a mix of nitrogen and vaporized diluent.

The polymerization in the second reactor was carried out at 82° C.

The slurry from the second reactor was transferred to the third reactor using further intermediate H<sub>2</sub> depressurization to adjust the amount of hydrogen to 2.8% by volume in the gas phase of the third reactor.

An amount of 270 g/h of 1-butene was added to the third reactor alongside with an amount of 36.4 kg/h of ethylene. A percentage proportion of 84% by volume of ethylene, 2.8% by volume of hydrogen, and 0.9% by volume of 1-butene was measured in the gas phase of the third reactor, the rest being a mix of nitrogen and vaporized diluent.

The polymerization in the third reactor was carried out at 85° C.

The polymer leaving the third reactor is then dried, pelletized and stabilized under the same conditions as defined in example 1.

Table 2 as shown below gives more details for the polyethylene composition prepared in example 2:

TABLE 2

	Example No. 2
W <sub>A</sub> [% by weight]	52
W <sub>B</sub> [% by weight]	22
W <sub>C</sub> [% by weight]	26
VN <sub>1</sub> [cm <sup>3</sup> /g]	85
VN <sub>2</sub> [cm <sup>3</sup> /g]	194
VN <sub>tot</sub> [cm <sup>3</sup> /g]	305
density [g/cm <sup>3</sup> ]	0.958
MFI <sub>190/5</sub> [dg/min]	1.0
SR [%]	118
FNCT [h]	10
NTS <sub>ISO</sub> [kJ/m <sup>2</sup> ]	14

The abbreviations in Table 2 have the same meanings as those in example 1.

We claim:

1. A polyethylene composition with trimodal molecular mass distribution, which comprises:

a density in the range from 0.955 to 0.960 g/cm<sup>3</sup> at 23° C.; an MFI<sub>190/5</sub> in the range from 0.8 to 1.6 dg/min;

from 45 to 55% by weight of a low-molecular-mass ethylene homopolymer A having a viscosity VN<sub>A</sub> in the range from 70 to 90 cm<sup>3</sup>/g;

from 20 to 35% by weight of a high-molecular-mass copolymer B made from ethylene and a 1-olefin

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comonomer having from 4 to 8 carbon atoms, wherein a mixture of homopolymer A and copolymer B has a viscosity number VN<sub>2</sub> in the range from 150 to 200 cm<sup>3</sup>/g; and

from 20 to 30% by weight of an ultrahigh-molecular-mass ethylene copolymer C containing a 1-olefin comonomer having from 4 to 8 carbon atoms, wherein a mixture of homopolymer A, copolymer B, and copolymer C has a viscosity number VN<sub>3</sub> in the range from 260 to 340 cm<sup>3</sup>/g, and wherein all of the percentage data are based on the total weight of the composition.

2. The polyethylene composition as claimed in claim 1, wherein the 1-olefin comonomer of copolymer B is present in an amount from 0.1 to 0.6% by weight, based on the weight of copolymer B and the 1-olefin comonomer of copolymer C is present in an amount from 0.5 to 2.5% by weight, based on the weight of copolymer C.

3. The polyethylene composition as claimed in claim 1 wherein the 1-olefin comonomer of copolymer B and the 1-olefin comonomer of copolymer C are independently selected from 1-butene, 1-pentene, 1-hexene, 1-octene, 4-methyl-1-pentene, or a mixture of these.

4. The polyethylene composition as claimed in claim 1, having a viscosity number VN<sub>tot</sub> of from 280 to 350 cm<sup>3</sup>/g measured by ISO/R 1191 in decalin at 135° C.

5. The polyethylene composition as claimed in claim 1, which has a swell ratio in the range from 115 to 145%, a notched impact strength (ISO) in the range from 8 to 14 kJ/m<sup>2</sup>, and a stress-crack resistance (FNCT) in the range from 8 to 20 h.

6. A process for producing a polyethylene composition with trimodal molecular mass distribution, having comprising a density in the range from 0.955 to 0.960 g/cm<sup>3</sup> at 23° C.; an MFI<sub>190/5</sub> in the range from 0.8 to 1.6 dg/min; from 45 to 55% by weight of a low-molecular-mass ethylene homopolymer A having a viscosity VN<sub>A</sub> in the range from 70 to 90 cm<sup>3</sup>/g; from 20 to 35% by weight of a high-molecular-mass copolymer B made from ethylene and a 1-olefin comonomer having from 4 to 8 carbon atoms wherein a mixture of homopolymer A and copolymer B has a viscosity number V<sub>AB</sub> in the range from 150 to 200 cm<sup>3</sup>/g; and from 20 to 30% by weight of an ultrahigh-molecular-mass ethylene copolymer C containing a 1-olefin comonomer having from 4 to 8 carbon atoms, wherein a mixture of homopolymer A, copolymer B, and copolymer C has a viscosity number VN<sub>3</sub> in the range from 260 to 340 cm<sup>3</sup>/g, wherein all of the percentage data are based on the total weight of the composition, and wherein the monomers are polymerized in slurry in a temperature range of from 20 to 120° C. at a pressure in the range of from 0.15 to 1 MPa, and in the presence of a high-mileage Ziegler catalyst composed of a transition metal compound and of an organoaluminum compound, the process comprising conducting polymerization in three stages, wherein the molecular mass of the polyethylene prepared in each stage is regulated with the aid of hydrogen, thereby forming a hydrogen concentration in each stage.

7. A process for producing a blow molding from a polyethylene composition with trimodal molecular mass distribution, comprising a density in the range from 0.955 to 0.960 g/cm<sup>3</sup> at 23° C.; an MFI<sub>190/5</sub> in the range from 0.8 to 1.6 dg/min; from 45 to 55% by weight of a low-molecular-mass ethylene homopolymer A having a viscosity VN<sub>A</sub> in the range from 70 to 90 cm<sup>3</sup>/g; from 20 to 35% by weight of a high-molecular-mass copolymer B made from ethylene and a 1-olefin comonomer having from 4 to 8 carbon atoms wherein a mixture of homopolymer A and copolymer B has a viscosity number V<sub>AB</sub> in the range from 150 to 200 cm<sup>3</sup>/g; and from 20

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to 30% by weight of an ultrahigh-molecular-mass ethylene copolymer C containing a 1-olefin comonomer having from 4 to 8 carbon atoms, wherein a mixture of homopolymer A, copolymer B, and copolymer C has a viscosity number  $VN_3$  in the range from 260 to 340  $\text{cm}^3/\text{g}$ , wherein all of the percentage data are based on the total weight of the composition, the process comprising:

- (a) plasticizing the polyethylene composition in an extruder in a temperature range of from 200 to 250° C.;
- (b) extruding the product of step (a) through a die into a mold;
- (c) blowing up the product of step (b) in a blow molding apparatus; and

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- (d) cooling the product of step (c) to solidify the blow molding.

8. The polyethylene composition as claimed in 4 where the viscosity number  $VN_{rel}$  is from 300 to 320  $\text{cm}^3/\text{g}$ .

9. The process as claimed in claim 6, wherein the viscosity number  $VN_3$  of the mixture of polymer A, polymer B, and polymer C is in the range of from 280 to 320  $\text{cm}^3/\text{g}$ .

10. The process as claimed in claim 7 where the blow molding is a container with a capacity in the range from 200 to 5000  $\text{cm}^3$ .

\* \* \* \* \*